

**PhD studentship (Full-time)**

Institution	Xi'an Jiaotong-Liverpool University, China
Department	Department of Mathematical Sciences
Supervisors	XJTLU principle supervisor: Dr. M.B.N. (Thijs) Kouwenhoven (Xi'an Jiaotong-Liverpool University, Department of Mathematical Sciences) UoL co-supervisor: Dr. Thomas Mohaupt (University of Liverpool, Department of Mathematical Sciences)
Application Deadline	Open until the position is filled
Funding Availability	Funded PhD project (world-wide students)
Project Title	Dynamical evolution of super-massive black holes in galaxy centers 超大质量黑洞在星系中心的动力学演化
Contact	Please email <a href="mailto:t.kouwenhoven@xjtlu.edu.cn">t.kouwenhoven@xjtlu.edu.cn</a> and copy <a href="mailto:doctoralstudies@xjtlu.edu.cn">doctoralstudies@xjtlu.edu.cn</a> with a subject line of the PhD project title

**Requirements:**

The candidate should have a first class or upper second class honours degree, or a master's degree (or equivalent qualification), in astronomy, physics, planetary sciences, applied mathematics, or related fields. Evidence of good spoken and written English is essential. The candidate should have an IELTS score of 6.5 or above, if the first language is not English. This position is open to all qualified candidates irrespective of nationality.

**Degree:**

The student will be awarded a PhD degree from the University of Liverpool (UK) upon successful completion of the program.

**Funding:**

The PhD studentship is available for three years subject to satisfactory progress by the student. The award covers tuition fees for three years (currently equivalent to RMB 80,000 per annum) and provides a monthly stipend of 3500 RMB as a contribution to living expenses. It also provides up to RMB 16,500 to allow participation at international conferences during the period of the award. It is a condition of the award that holders of XJTLU PhD scholarships carry out 300-500 hours of teaching assistance work per year. The scholarship holder is expected to carry out the major part of his or her research at XJTLU in Suzhou, China. However, he or she is eligible for a research study visit to the University of Liverpool of up to three months, if this is required by the project.

**Project Description:**

Galaxies are the building blocks of our Universe, but their origin and evolution is still poorly understood. Most galaxies, including our own Milky Way, host a supermassive black hole

in their center. These black holes grow over time, partially through accretion of stars and gas, but primarily due to mergers with other black holes that were deposited in their host galaxy following galaxy mergers. Following a galaxy merger, the two black holes of a merged galaxy pair sink to the center of the merger product, where they form a shrinking binary and finally coalesce. This violent event produces gravitational waves, a phenomenon that was detected for the first time in 2015. This process takes over a gigayear; chances are large that another galaxy merger occurs, and a third black hole is deposited in the system. This third body interacts gravitationally with the others, and may speed up, slow down, or even prevent black hole mergers. The PhD candidate will carry out computer simulations to study such situations, in order to study the dynamics and fate of the different possible configurations, and will also predict gravitational wave signatures to prepare for the next generation of gravitational wave detection facilities. The study will be carried out in collaboration with Prof. Rainer Spurzem (National Astronomical Observatories of China, CAS, and Astronomisches Rechen-Institut, Zentrum für Astronomie; University Heidelberg) and Dr. Thorsten Naab (University Observatory Munich, Faculty of Physics, Ludwig Maximilians University, and Max-Planck-Institute for Astrophysics).

For more information about doctoral scholarship and PhD programme at Xi'an Jiaotong-Liverpool University (XJTLU): Please visit

<http://www.xjtlu.edu.cn/en/admissions/phd/entry-requirements.html>

<http://www.xjtlu.edu.cn/en/admissions/phd/feescholarships.html>

### **How to Apply:**

Interested applicants are advised to email.....@xjtlu.edu.cn (XJTLU principal supervisor's email address) the following documents for initial review and assessment (please put the project title in the subject line).

- CV
- Two reference letters with company/university letterhead
- Personal statement outlining your interest in the position
- Proof of English language proficiency (an IELTS score of 6.5 or above)
- Verified school transcripts in both Chinese and English (for international students, only the English version is required)
- Verified certificates of education qualifications in both Chinese and English (for international students, only the English version is required)

**Informal enquiries** may be addressed to Dr. M.B.N. Kouwenhoven (t.kouwenhoven@xjtlu.edu.cn), whose personal profile is linked below:

<http://www.xjtlu.edu.cn/en/departments/academic-departments/mathematical-sciences/staff/m-kouwenhoven> and <http://www.thijskouwenhoven.net>.